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Daron:

This is a copy of the 1st text page
on the Evaluation of Underground Mining
under the Questar Pipeline Corridor within the
One-half mile Distance of Blasting at Whiskey
Creek Surface Mine.

Dave

Underground Mining Evaluation

This report is compiled to address concerns of the amount of support and the stability of the pillars remaining under the Questar Gas Pipeline within the one-half mile distance of blasting that will occur during the operation of the Whisky Creek Surface Mine located in the head of the Whisky creek Canyon. This report will identify the corridor of protection on a 35 degree angle of draw to the Upper O'Connor seam workings in the White Oak #1 Mine and to the Lower O'Connor seam workings in the White Oak #2 Mine.

Areas were selected within the corridor to illustrate the percentage of coal left in that area for support of the gas pipeline. The mining in these mines were conducted by three separate mining companies and the record used was from the mine maps that were submitted to the Mine Health and Safety Administration as certified copies of the mining completed. The calculation of the percentage of coal left as support was accomplished by identifying an area and measuring the area to determine the total square feet of coal that was in the area prior to mining. The entries and crosscuts were measured for length and width and an area of removed coal was calculated. The percent recovery was calculated by dividing the recovered area by the total area. The percentage of coal remaining was determined by subtracting the percent recovery from one. Table 1 contains the calculations for the Upper O'Connor Seam Mine #1 and Table 2 contains the calculations for the Upper O'Connor Seam Mine #2.

The tables show that in all instances the percentage of coal left as support was greater than 50 percent. On Table 1 the percent of support coal ranged from 50.16% in Area E to 72.04% in Area C identified on the Map titled Upper O'Connor Seam White Oak #1 Mine Gasline Protection Corridor Stability. Similar areas of support are provided on Table 2. These areas were selected to coincide with the areas in the upper seam. The support coal on Table 2 ranged from 51.25% in Area H2 to 68.45% in Area F2 identified on the Map titled Lower O'Connor Seam White Oak #2 Mine Gasline Protection Corridor Stability.

Please refer to documents already included in the permit for further details see the Ground Control Study For Double Lift Mining Panels; August 1989; Kenneth C. Ko & Associates report in Appendix 523 Labeled "Confidential". Copies are held at the Division office in Salt Lake City, Utah.

Locations of pillar stability analysis are depicted on both mine maps included in this report. The evaluation of the stability factors was completed by using NIOSH's ARMPS (Analysis of Retreat Mining Pillar Stability) program. The program was developed to prevent pillar squeezes, massive pillar collapses, and bumps critical to the safe and efficient retreat mining of coal. The program calculates stability factors based on loads applied to, and the load bearing capacities of pillars during development and retreat mining operations. When the ARMPS safety factors fall below 0.75 satisfactory support characteristics are rare and greater than 1.5 the support characteristics are above being acceptable.

The ARMPS program was used on various pillar locations along the corridor using the overburden depth, an entry width of 18 feet, a development height of 9 feet and a total height after bottom coal